

L1
cmf
wherein one boundary of said region is located within the channel region and is not aligned with edges of the gate electrode, and the other boundary is located within one of the source region and said drain region.

L2
84. (Amended) A semiconductor device comprising:
a semiconductor layer including a channel region and source and drain regions in contact with said channel region at a source-channel boundary and a drain-channel boundary, respectively;
a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween; and
a region having a higher energy band gap than any of said source, drain, and channel regions,
wherein said region is formed in the vicinity of at least one of said source-channel boundary and said drain-channel boundary, and one boundary of said region is located within the channel region and is not aligned with edges of the gate electrode.

L3
90. (Amended) A semiconductor device comprising:
a pixel portion formed over an substrate, said pixel portion comprising a plurality of pixels; and
at least one driver circuit for driving said pixels formed over the substrate, said driver circuit comprising:
a semiconductor layer including a channel region and source and drain regions in contact with said channel region at a source-channel boundary and a drain-channel boundary, respectively;
a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween; and
a region formed in said semiconductor layer, said region containing one or more elements selected from the group consisting of carbon, nitrogen, and oxygen at a concentration of 1×10^{19} atoms/cm³ or more,

L3
cont.

wherein said region is formed in the vicinity of at least one of said source-channel boundary and said drain-channel boundary, and one boundary of said region is located within the channel region and is not aligned with edges of the gate electrode.

L4

96. (Amended) A semiconductor device comprising:
a pixel portion formed over an substrate, said pixel portion comprising a plurality of pixels; and
at least one driver circuit for driving said pixels formed over the substrate, said driver circuit comprising:
a semiconductor layer including a channel region and source and drain regions in contact with said channel region at a source-channel boundary and a drain-channel boundary, respectively;
a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween; and
a region having a higher energy band gap than any of said source, drain, and channel regions,
wherein said region is formed in the vicinity of at least one of said source-channel boundary and said drain-channel boundary, and one boundary of said region is located within the channel region and is not aligned with edges of the gate electrode.

L5

102. (Amended) A semiconductor device comprising:
a pixel portion formed over an substrate, said pixel portion comprising a plurality of pixels; and
at least one driver circuit for driving said pixels formed over the substrate, said driver circuit comprising:
a semiconductor layer including a channel region and source and drain regions with said channel region interposed therebetween; and
a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween;

L⁵ wherein said semiconductor layer has at least one region including carbon and overlapping both a portion of said channel region and a portion of said source and drain regions at concentration of 1×10^{19} atoms/cm³ or more, and

wherein one boundary of said region including carbon is located within the channel region and is not aligned with edges of the gate electrode, and the other boundary is located within one of the source region and said drain region.

L⁶ 110. (Amended) A semiconductor device comprising:
a pixel portion formed over an substrate, said pixel portion comprising a plurality of pixels; and
at least one driver circuit for driving said pixels formed over the substrate, said driver circuit comprising:
a semiconductor layer including a channel region and source and drain regions with said channel region interposed therebetween; and
a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween;
wherein said semiconductor layer has at least one region including nitrogen and overlapping both a portion of said channel region and a portion of said source and drain regions at concentration of 1×10^{19} atoms/cm³ or more, and
wherein one boundary of said region including nitrogen is located within the channel region and is not aligned with edges of the gate electrode, and the other boundary is located within one of the source region and said drain region.

L⁷ 118. (Amended) A semiconductor device comprising:
a pixel portion formed over an substrate, said pixel portion comprising a plurality of pixels; and
at least one driver circuit for driving said pixels formed over the substrate, said driver circuit comprising:
a semiconductor layer including a channel region and source and drain regions with said channel region interposed therebetween; and

L7 a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween;

wherein said semiconductor layer has at least one region including oxygen and overlapping both a portion of said channel region and a portion of said source and drain regions at concentration of 1×10^{19} atoms/cm³ or more, and

wherein one boundary of said region including oxygen is located within the channel region and is not aligned with edges of the gate electrode, and the other boundary is located within one of the source region and said drain region.

L8 126. (Amended) A semiconductor device comprising:

a pixel portion formed over an substrate, said pixel portion comprising a plurality of pixels, each of said pixels comprising:

a semiconductor layer including a channel region and source and drain regions with said channel region interposed therebetween;

a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween; and

a region formed in the vicinity of at least one of a source-channel boundary and a drain-channel boundary in said semiconductor layer, said region containing one or more elements selected from the group consisting of carbon, nitrogen, and oxygen at a concentration of 1×10^{19} atoms/cm³ or more,

wherein one boundary of said region is located within said channel region and is not aligned with edges of the gate electrode.

L9 134. (Amended) A semiconductor device comprising:

a pixel portion formed over an substrate, said pixel portion comprising a plurality of pixels, each of said pixels comprising:

a semiconductor layer including a channel region and source and drain regions with said channel region interposed therebetween;

a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween; and

L⁹
a region having a higher energy band gap than any of said source, drain, and channel regions, said region formed in the vicinity of at least one of a source-channel boundary and a drain-channel boundary in the semiconductor layer,
wherein one boundary of said region is located within said channel region and is not aligned with edges of the gate electrode.

L¹⁰
140. (Amended) A semiconductor device comprising:
a pixel portion formed over an substrate, said pixel portion comprising a plurality of pixels, each of said pixels comprising:
a semiconductor layer including a channel region and source and drain regions with said channel region interposed therebetween; and
a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween,
wherein said semiconductor layer has at least one region including carbon and overlapping both a portion of said channel region and a portion of said source and drain regions at concentration of 1×10^{19} atoms/cm³ or more, and
wherein one boundary of said region including carbon is located within the channel region and is not aligned with edges of the gate electrode, and the other boundary is located within one of the source region and said drain region.

L¹¹
146. (Amended) A semiconductor device comprising:
a pixel portion formed over an substrate, said pixel portion comprising a plurality of pixels, each of said pixels comprising:
a semiconductor layer including a channel region and source and drain regions with said channel region interposed therebetween; and
a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween;
wherein said semiconductor layer has at least one region including nitrogen and overlapping both a portion of said channel region and a portion of said source and drain regions at concentration of 1×10^{19} atoms/cm³ or more, and

L¹¹ wherein one boundary of said region including nitrogen is located within the channel region and is not aligned with edges of the gate electrode, and the other boundary is located within one of the source region and said drain region.

L¹² 152. (Amended) A semiconductor device comprising:
a pixel portion formed over an substrate, said pixel portion comprising a plurality of pixels, each of said pixels comprising:
a semiconductor layer including a channel region and source and drain regions with said channel region interposed therebetween; and
a gate electrode adjacent to said channel region with a gate insulating film interposed therebetween;
wherein said semiconductor layer has at least one region including oxygen and overlapping both a portion of said channel region and a portion of said source and drain regions at concentration of 1×10^{19} atoms/cm³ or more, and
wherein one boundary of said region including oxygen is located within the channel region and is not aligned with edges of the gate electrode, and the other boundary is located within one of the source region and said drain region.
